On the wrong side of the wires

Many can't get high-speed Net access

Continued from 1B

art wires to handle high-speed services are being deployed.

The location of these wires is important. It's expensive, and sometimes impossible, to provide broadband to those who are far from these high-capacity fiber-optic lines.

Phone company digital subscriber line (DSL) services, for example, can reach a maximum of three miles from the central switching facility. And top speeds decline at the far reaches of this technological leash.

SPECIAL REPORT

At best, they will be able to offer DSL to two-thirds of all their customers.

Only about 5% of all buildings in the USA are connected to high-speed fiber rings. And while about 90% of businesses with more than 500 employees have zippy Internet connections — often through T-1 connections — among the 21 million smaller companies "only 5% to 7% have high speed," says Phil Burgess, president of the Center for the New West, a Denver-based think tank.

"This is a very significant problem for all of us," says US West CEO Solomon Trujillo. "In the past, if you were a small business, you could compete because you were more agile. But it's different in an Internet-based world."

Rural America is most at risk. About 86% of the Internet delivery capacity in the USA is concentrated in the 20 largest cities.

"The entire Midwest is simply not part of the information highway," says Mitchell Moss of New York University's Taub Urban Research Center. "It's the whole Great Plains, all the places that voted for Bob Dole."

Yet even in big cities, phone companies vie to reach businesses in financial districts and outlying corporate campuses — leaving other neighborhoods behind.

The pattern appears in cities such as Atlanta; Denver; Detroit; Dallas; Seattle; Salt Lake City; Tucson; Minneapolis/St. Paul; New Orleans; Portland, Ore.; Washington; Kansas City; Des Moines; and Omaha, according to InContext. The research firm has studied how high-speed lines are being deployed in more than 30 cities.

FCC 'greatly' concerned

"It concerns me greatly," says Federal Communications Commission Chairman William Kennard. "The private sector builds where the high volume and the money is. In most communities, the fiber-optic rings circle the business district. If you're in a poor suburban neighborhood or the inner city, you're at risk."

What's more, providers that have spent years building their infrastructures "don't come back and fill in" the underserved neighborhoods, says William Lilley, co-founder of InContext. "They only do a high-end business."

That may be a shrewd financial strategy. But the social impact could be devastating.

Neglected communities tend to be the ones struggling hardest, including those with high concentrations of minorities.

If the trends don't change, these communities will miss out on developing high-speed home uses, such as telemedicine, distance learning and telecommuting.

And economic development will suffer. When inner cities don't get high-speed Internet "employers are limited in the jobs they can create," says B. Keith Fulton, director of technology programs and policies for the National Urban League. "It's a disinvestment. It puts the community further behind the curve."

Others fear the same thing.

In industrial states "growing high-tech business is absolutely essential — that's where the growth is, not heavy industry," says Thomas Paese, Pennsylvania's secretary of administration. Yet, "Every place I go, when we talk to companies that depend on e-commerce, the first thing out of their mouths, after their concern about skilled labor, is, 'If we don't have high-speed access, then we can't compete, and we'll find it someplace else.' "

"The entire Midwest is simply not part of the information highway."

— Mitchell Moss, New York University's Taub Urban Research Center

Who's in control

Most businesses crave new services offered by phone and cable companies.

Telephone DSL services offer continuous high-speed Internet access — which doesn't require dialing up a provider for each session — over existing phone connections. It costs about $100 a month, sometimes less than $50. That's much more attractive than today's pricey T-1 lines, or ISDN lines, which are only twice as fast as conventional phone modems.

DSL services typically range from 640,000 bits per second to 1.5 million. That's the minimum needed for even basic, herky-jerky video.

Cable companies also are starting to roll out always-on high-speed Internet services, usually for about $40 a month — more if you don't already subscribe to cable TV. They transmit data via TV wires using special cable modems. Speeds go from 6 million to 10 million bits per second, but can slow dramatically if too many neighboring subscribers use the service at the same time.

While there's no set definition for high speed, the FCC classifies a broadband service as one that both sends and receives data at four times the speed of a 56,600 bits-per-second telephone modem. That rules out the leading satellite Internet service, DirecPC. It sends data to users at 400,000 bits, but receives data from subscribers via regular phone lines.

So phone and cable companies still control high-speed Internet access, and forecasters say that will continue for the foreseeable future.

Some providers, particularly cable companies, say they are making a serious effort to serve everybody. They say that any disparities in service by neighborhood are a temporary situation, merely reflecting that broadband is in its infancy.

"We don't red-line at our company," says No. 2 cable operator Time Warner's CEO Gerald Levin.

Big cities get first crack

Yet many forecasters anticipate a huge division between the high-speed haves and have-nots. By the end of 2002, about half of all households will be able to choose between a phone and a cable high-speed service, according to the Yankee Group, a research firm. At the same time, about 40% of the country won't be able to get any high-speed service.

When it comes to businesses, though, it's no contest. Since nearly all businesses already have phone connections — and few have cable — about 90% of the business market will go with DSL, according to Donaldson Lufkin & Jenrette.

And that's where you see the starkest divisions between the haves and have-nots.

Most of those who subscribe to affordable DSL services get them from a new generation of phone companies such as Covad, Rhythms, and NorthPoint — known as competitive local exchange carriers (CLECs). They have recently built high-speed infrastructures geared to serve businesses. And they clearly target the hottest prospects because it costs so much to build a high-speed network: as much as $1,500 per subscriber.

"We build first in the largest metro areas — the NFL cities — and in the business districts," says Ralph Montfort of MCI WorldCom's DSL business, UUNet. "Capitalism would say, if you want to stay in business, you go to the markets where you have the customers. I don't think the CLECs are trying to be mean and ugly. We're trying to run a business, and you're just seeing the first move."

Some also assert that today's disparity in broadband services won't hobble communities' economic development. "Businesses look at everything" when they decide where to locate, says AT&T Internet Services President Kathleen Earley, whose company offers DSL and cable services. "Communications is just one thing on a checklist."

Besides, CLECs say, they fill a void left by the regional Bells — such as Bell Atlantic, US West and SBC — which are just beginning to offer DSL services. "(The Bells') DSL is not for business at all," Rhythms CFO Scott Chandler told analysts at a meeting hosted by Kagan Seminars. "Look at where they deploy. They go where cable companies have cable modems."

Others agree that the established Bells' high-speed plans involve more noise than effort.

"It's the dirty little secret," says SoftNet Systems CEO Larry Brilliant. The regional Bells "don't want to sell DSL (to business) and undermine their T-1 business."

A world of difference

Many places can't afford to wait, though. As the pace of technological and economic change quickens, communities that are just a few years behind the curve face "a very real problem," says Bill Mitchell, dean of the school of architecture and planning at MIT, and author of *e-topia*.

"It's a matter of jobs and quality of life," says Ken Fellman, a telecommunications lawyer who chairs the FCC's Local and State Government Advisory Committee. "Every economic development director you can talk to will say the question they get asked most is: 'What access do you have to high-speed telecommunications?' "

The mess will become more apparent as small and midsize businesses begin their stampede to the Internet. In five years, about half of all businesses with fewer than 100 employees will have broadband connections, according to investment firm Stephens Inc.

Others agree that smaller businesses are about to revolutionize the Net as they find new ways to handle basic chores and reach customers.

"I don't think it will be a couple of years. It will be a couple of quarters," says Kneko Burney, who follows the small-business market as director of on-line computing for Cahners In-Stat Group.

Indeed, small business will be a rocket behind an astonishing 1,216% growth in business-to-business Internet services from 1999 to 2003, Goldman Sachs predicts. These sites will generate $1.5 trillion in revenue in the USA. That dwarfs popular consumer-oriented Internet services, which offer news, entertainment and sales of products such as books and CDs.

Some companies are already flocking to places where they can get affordable high-speed hookups. It's such a strong selling point that commercial real estate developers go to great lengths to ensure that their buildings are wired.

"There's no question, it's real and it's big-time," says developer Charlie Hall of Grubb & Ellis in Phoenix.

Yet that won't be enough to satisfy small businesses' demand for speed as the Internet penetrates Main Street and beyond:

▶ Local dealers for companies such as Goodyear and Navistar now turn to private sites to find out what inventory is available — and to place their orders.

▶ Bankers, lawyers and dealmakers who need to edit and share documents with others use services such as Intralinks to collaborate on line instead of overnighting packages of pages every time someone makes a revision.

▶ Farmers use the Internet "just like a stockbroker," says South Dakota Public Utilities Commission Chairman Jim Burg. "If he's selling grain or livestock on line, and he misses the price, he's at a disadvantage."

▶ Small retailers find they can boost sales by attracting orders on Web sites. That's how a Vermont music store, Play It Again Sam, sold banjos to pickers in Nashville. And Osborn Drugs, in tiny Miami, Okla., took in orders from as far away as London and Tokyo.

▶ Government employees also see the Internet as a convenient new vehicle for circulating public documents and requests for proposals.

"As the Internet continues to grow, we're going to have to have high speed. Otherwise, everything will get bottlenecked," says Dan McFarland, chief information officer for the city of Dallas.

Those who have broadband say it makes a world of difference.

Garbage truck maker Wayne Engineering found that out recently when the municipal utility in Cedar Falls, Iowa, began offering a cable modem service. It enabled the company to start e-mailing technical drawings worldwide to promote sales.

Before then, with a regular telephone modem, "our experts advised us, 'Don't even go there,' " says Wayne Worthington, vice president of sales and engineering. "They're multiple megabytes of 3-D drawings."

Having seen what high speed can do, he adds, the thought of doing business without it "is like saying, 'Would you move in without a road?' "

And the company is hatching ambitious plans to put its inventory of parts on the Web so customers can check them out and place orders. In a hard-fought business "it's not called a competitive advantage," says company President Cynthia Goro. "It's called staying alive."

Goro: Wayne Engineering chief.

Yet government regulators remain reluctant to insist that high-speed services be provided everywhere. To a large extent, today's imbalances flow from federal efforts to encourage competitors to take on regional Bells — which have enjoyed near monopolies in the local phone business. Lawmakers gave CLECs a lot of latitude to decide what customers they'll serve and how much they'll charge.

By going after business customers, Rhythms reports, it takes in about $138 a month from each line it installs.

While that sounds like a lot, customers get a great deal when several providers compete. Providers usually package high-speed Internet access with telephone services at prices that can run about 25% less than those offered by the Bells.

Hope for the future

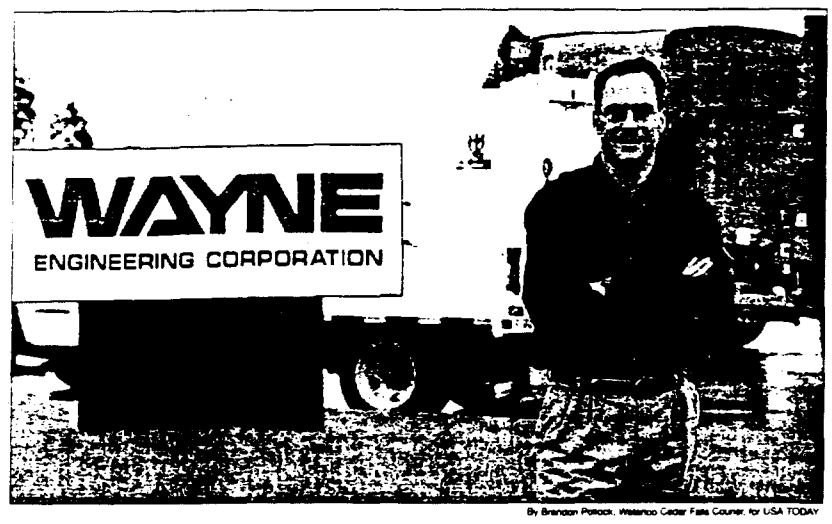
It's too early to say how long regulators and the public will tolerate a two-tiered system in which some communities enjoy inexpensive, state-of-the-art broadband services while others either pay extravagant amounts or wait to join the revolution.

But there's growing recognition that the trends are worrisome and deserve attention.

Some state and local governments are already taking action. For example, Pennsylvania plans to award its telecommunications business to companies that agree to connect underserved areas. And municipally owned utilities are building high-speed lines in communities such as Cedar Falls and Harlan, Iowa; Wadsworth, Ohio; and Glasgow, Ky.

Yet these efforts still leave much of the country vulnerable.

"There's cause for hope and for concern," says Kennard. "The Internet is the fastest-growing technology the world has ever known. It really is stunning. But when you look at who's logging on, it breaks along income levels and race. We've got to have a sense of urgency, and do everything we can."



By Brandon Pollock, Waterloo Cedar Falls Courier, for USA TODAY

Speed demon: Wayne Worthington of garbage truck maker Wayne Engineering in Cedar Falls, Iowa, has come to depend on high-speed Internet to e-mail technical drawings worldwide to promote sales.

"It's like saying, 'Would you move in without a road?' "

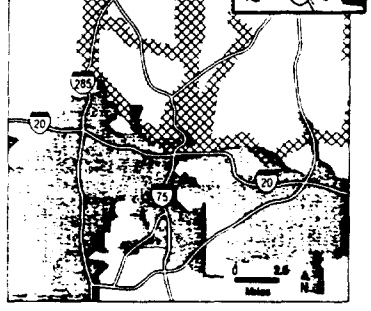
— Wayne Worthington, VP of sales and engineering at Wayne Engineering on the importance of high-speed Internet access in choosing a location

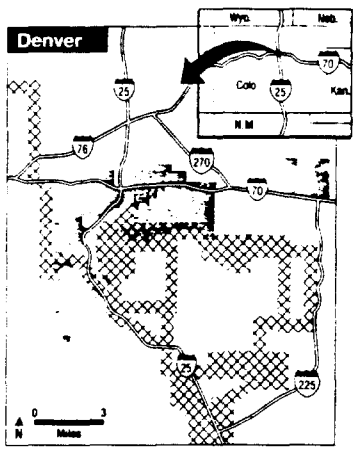
Fiber-optic corridors leave out minorities

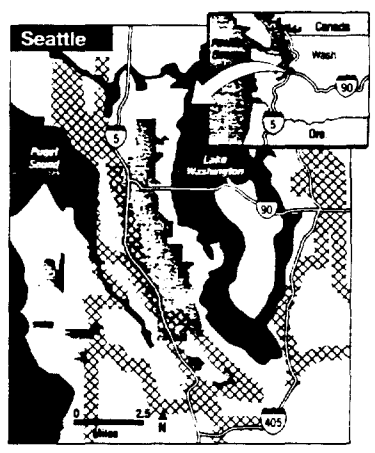
These maps show areas where fiber-optic trunk lines have been built by major competitive phone companies in Atlanta, Denver and Seattle. In each case, the lines tend to skirt areas that have mostly minority populations. This can be a significant barrier to future economic development for these areas. The analyses were made available to USA TODAY by InContext, an economic consulting firm, and use publicly available sources. InContext has found similar patterns in more than 30 metropolitan areas. The company's clients include regional Bell systems, the Justice Department and European phone companies.

Mostly minority neighborhoods

Areas where fiber-optic trunkline have been laid







Source: InContext

By Grant Jerding, USA TODAY

Bridging the digital divide

Experts agree that broadband will revolutionize business and that a digital divide is intolerable.

But there's little consensus about what — if anything — needs to be done to correct it.

A lot depends on how quickly various services grow, whether they will reach into underserved areas and whether government action now could do more harm than good.

To help sort things out, reporter **David Lieberman** looked at high-speed Internet providers' plans — and at what executives, officials and activists say needs to be done.

REGIONAL BELLS

Why are the Bell phone companies so interested in the high-speed divide?

Regional Bell phone companies such as US West and Bell Atlantic have a strong incentive to complain about the divide between the high-speed haves and have-nots.

They hope the issue will lead Congress or federal communications regulators to relax rules barring the Bells from lucrative long-distance service — at least for data.

What's the connection between Internet and long-distance? The FCC doesn't distinguish between voice calls and data connections. And because the Bells can't offer long-distance yet, they can't create fiber-optic links between communities in different local calling areas.

Without those links, they say, they won't have the economies of scale needed to make DSL investment pay off — particularly in rural areas. "We've created an economic disincentive at a time when we need more infrastructure deployed," says former White House press secretary Mike McCurry, who co-chairs tAdvance, a lobby group supporting the phone companies.

US West, which already has about 40% of all DSL buyers, says it could justify a faster roll-out if it could link cities such as Denver and Colorado Springs, Phoenix and Tucson, and Omaha and Des Moines.

What's more, the Bells say, the divisions make it costly to handle many Internet transmissions. The Bells must hand long-distance calls off to a third party, such as MCI WorldCom or AT&T.

That means the Bells would pay a hefty per-mile leasing charge to send data on a wild ride through someone else's long-distance network, even if the final destination is relatively nearby.

But the FCC and others are unconvinced. Regulators say the Bells can offer long-distance as soon as they give competitors more access to the local phone infrastructure, something the Bells are fighting in court and at the FCC.

"In my view, there aren't any shortcuts to it," FCC Chairman William Kennard says.

And for once, consumer advocates agree with him.

If the rules are relaxed, then "you're inviting the Bells to recreate pieces of the monopoly" they once held in phone services, says Media Access Project President Andrew Schwartzman.

What's more, there's no guarantee that the Bells would provide affordable DSL service to the high-speed have-nots — and undercut their lucrative T-1 services.

They're ramping up DSL service just to remain competitive in areas where cable operators are starting to offer broadband, Kennard says.

Downloading a 'Titanic' file

How much of the 3-hour, 14-minute movie 'Titanic' could be downloaded by these modems and data lines in 7 minutes, 23 seconds:

DESCRIPTIONS

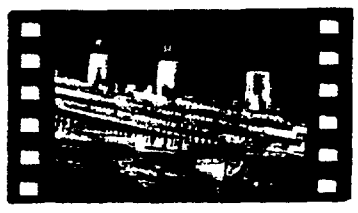
▶ Cable modem
This modem uses the cable TV wire, instead of a phone line, for data transmission. The coaxial cable can carry much more data than a copper phone line. It's often faster, as well as less expensive, than most alternatives. But customers in a neighborhood share the trunk lines, which means speed can slow when usage is high.

▶ DSL
Digital Subscriber Line technology uses existing phone connections with a DSL modem to provide service at relatively low cost. Speeds vary considerably, and it's often faster to download than to transmit. The variations depend on:
▶ Quality of the Internet service provider's equipment
▶ Level of service the customer orders
▶ Distance from the phone switching facility

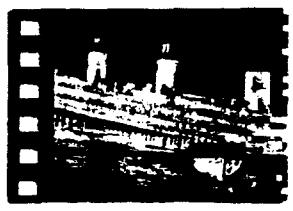
▶ T-1 line
A fast phone technology using a dedicated line to serve several phones. But it's expensive to install, with prices rising the farther the user is from the nearest phone switching facility. Also, the monthly charge is high.

▶ ISDN
An Integrated Services Digital Network connection can connect several phones. But many say it's not fast enough to be worth the special hardware and, usually, the dedicated phone line it needs. Service is limited to within one mile of the phone-company switching facility.

▶ Phone-line modem
This inexpensive modem — the most common now — connects to an ordinary phone line. It transmits and receives data at one relatively slow rate.



Cable modem
▶ **Speed:** 10 Mbps[1]
100%
▶ **Complete download:** 7 minutes, 23 seconds



DSL or cable modem
▶ **Speed:** 8 Mbps
80%
▶ **Complete download:** 9 minutes, 14 seconds

DSL or cable modem
▶ **Speed:** 4 Mbps
40%
▶ **Complete download:** 18 minutes, 30 seconds

T-1 line or DSL
▶ **Speed:** 1.5 Mbps
15%
▶ **Complete download:** 49 minutes, 20 seconds

ISDN
▶ **Speed:** 128 Kbps[1]
0%
▶ **Complete download:** 9 hours, 14 minutes

Phone-line modem
▶ **Speed:** 28.8 Kbps
0%
▶ **Complete download:** 42 hours, 30 minutes

KEY TERMS

▶ Fiber-optic line
Bundled strands of glass fibers capable of handling vastly more information than coaxial cables (cable TV lines) or copper wires (standard phone lines) can carry. Pulses of light travel through fiber lines before they are converted to digital data.

▶ CLEC
Short for Competitive Local Exchange Carriers. These companies became important challengers to the Baby Bell monopolies after the passage of the Telecommunications Act of 1996. The law enabled new providers to put their equipment in an established phone company's facilities and to transmit service through existing phone connections. CLECs primarily provide state-of-the-art phone and Internet services for business.

1 — Mbps = million bits per second; Kbps = thousand bits per second

Source: Center for the New West — By Jim Sargent, USA TODAY

CABLE COMPANIES

Will cable operators' high-speed services help close the gaps for small business left by phone companies?

Cable companies say they could be a wild card in digital equality. They're spending billions to upgrade their systems and by 2005 will offer broadband to as many as 80% of the 102 million homes expected to be served by cable.

That will be just the ticket for personal users and people who work at home. But other business customers will be disappointed.

Cable operators often don't wire business districts and rural areas. Companies in areas that do get cable may find its consumer-oriented services too limited for their needs.

And it's unclear — and hotly debated — whether providers will serve the inner city and rural areas most in danger of being left behind.

The two dominant cable Net services — At Home and Road Runner — say they target home users. That's why they don't let customers connect file servers to the cable service. Small offices wanting their own domain name and multiple e-mail accounts also are out of luck.

At Home warns it "does not provide the type of security, upstream performance and total downstream throughput capability typically associated with commercial use."

To keep a few customers from hogging system resources, At Home has tested limiting user transmissions to 128,000 bits per second — little more than twice as fast as a conventional telephone modem.

Businesses wanting more, and more robust, service from cable would need to sign up for a related product called At Work.

Cox Communications is the only operator that provides it via cable, at a minimum of $100 a month. AT&T says it will soon offer market tests in areas of Chicago, Dallas, Denver, San Francisco, Seattle and Portland, Ore.

And it remains to be seen how many underserved neighborhoods get any of these services.

"We've found, in most urban systems, that the early deployment of two-way cable modems is to high-income, geographically dense residential neighborhoods," InContext Systems CEO William Lilley says.

Operators dispute that. "We rebuild the whole system and market (broadband) to everybody," says President Stephen Burke of Comcast, which offers At Home.

They say they won't leave lots of customers behind. MediaOne's Susan Eid says: "We've made the economic decision to build out these networks as fast as we can because we face competition."

On the wrong side of the wires

WIRELESS

Will new wireless technologies serve the businesses and people neglected by phone and cable companies?

It could happen. But Wall Street forecasters say it'll take at least a decade before these newcomers begin to be serious contenders.

By 2008, cable operators will dominate the high-speed business with 18 million subscribers, followed by phone companies with 14.3 million, according to Paul Kagan Associates. Satellite broadcasters will be far behind at 2 million.

Satellites aren't a big factor now because subscribers to services such as DirecPC still need a land route, typically a phone connection, to transmit e-mail or files to the Internet. Customers consider that too complicated and inefficient.

That could change in 2003, when interactive services using low-orbit satellites enter the fray.

Hughes plans to replace DirecPC with Spaceway. Users will be able to send and receive at speeds up to 6 million bits per second.

And in 2004, Teledesic, a project backed by Bill Gates and cell phone pioneer Craig McCaw, says it will enable users to receive data at 64 million bits per second and transmit at 2 million.

"Building the infrastructure to provide broadband Internet access globally is the single biggest business opportunity on the planet over the next few decades," Teledesic Vice Chairman Russ Daggatt told a congressional panel in June.

But others wonder whether the services can be made affordable — and whether transmission will be hurt by rain and other interference.

"I don't believe broadband satellite services will offer a real alternative to the residential market or to small and medium-size businesses," says Teligent President Kirby Pickle. "And that's the market that will be in the forefront of demanding new, broadband connections."

His wireless communications company is one of a group betting smaller customers will prefer Internet service via microwave signals to and from a roof-top antenna.

The technology started to grab investors' imaginations last year after the FCC ruled that the so-called wireless cable companies could shift from offering TV channels to two-way data communications.

Yet they also may have to struggle to compete.

The biggest fight in cities is to get antennas on top of buildings. They are needed to extend the reach of the signals, which must be aimed directly at a user's antenna and have a top range of about 5 miles.

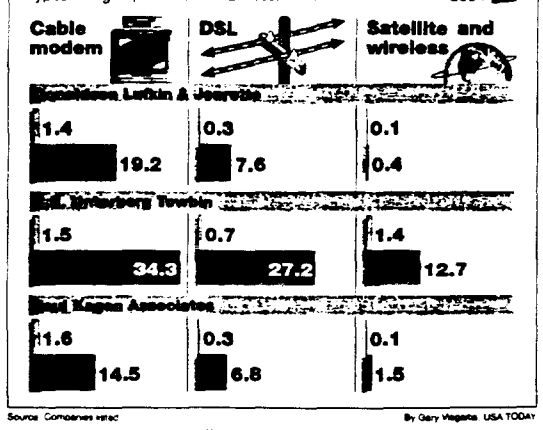
Companies also could have problems with landlords of big buildings who won't let them connect to internal phone wires. Multiple dwellings are about a third of all residences.

"It can take as long as two years to negotiate access rights with building owners," Winstar CEO William Rouhana told Congress in May. "At this rate, it will take decades to obtain access rights to all the buildings and customers that our networks are designed to reach."

High time for high speed

Here are experts' forecasts of subscribers for these types of high-speed Internet access, in millions:

Key: 1999, 2004



Source: Companies cited — By Gary Visgaitis, USA TODAY

FEDERAL REGULATORS

What is the Federal Communications Commission doing about this?

Regulators are making a big bet. They're counting on a slew of companies, mostly using new wireless technologies, to swoop in and provide high-speed services to communities neglected by phone and cable companies.

Commissioners are approving licenses that enable providers to use new parts of the airwave spectrum for broadband. Meanwhile, they're taking a light touch in regulating competitive phone and cable high-speed providers.

"We need to be incentivizing the marketplace," FCC Chairman William Kennard says.

While he doesn't have a specific standard for determining whether that policy is working, he has extravagant expectations — especially for wireless, which he calls a "sleeper" technology.

"I'd like to see broadband available to every home in three to five years," Kennard says. "That's certainly reasonable. I'm fundamentally an optimist about the ability of technology to change people's lives dramatically."

In the meantime, when phone and cable companies seek approval for their recent mergers, the agency pressures them to provide high-speed connections to schools and libraries in low-income communities.

The FCC's position plays well in Washington, where deregulation is still in vogue.

But consumer advocates say Kennard's position is an expedient copout that will leave a wide divide between the high-speed haves and have-nots.

By Robert Deutsch, USA TODAY

Kennard: Has high tech hopes.

"He's not a prognosticator. He's the chairman of the FCC," Consumers Union's Gene Kimmelman says. "It's his job to step in and protect against market failure. The history of silly optimism here is constantly being repeated. It reflects his lack of backbone to intervene."

They also note that the FCC's position doesn't square with the Telecommunications Act of 1996. It calls for the regulators to take "immediate action" if advanced services such as broadband are not being offered to "all Americans" in a timely way at affordable rates.

But Kennard says the FCC is acting, for example, by approving the wireless licenses. And, he says, there's no way to reach conclusions about the emerging high-speed business without making predictions.

"Anybody who is not alert to where the market is going shouldn't be in the regulatory business," he says. "If we've learned anything about this marketplace, it's that the key is to get as many players on the field as possible."

"I'd like to see broadband available to every home in three to five years. That's certainly reasonable."

– William Kennard, FCC chairman